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ORIGINAL ARTICLE

Work Participation and Health Status in Early Osteoarthritis of the Hip and/or Knee: A Comparison Between the Cohort Hip and Cohort Knee and the Osteoarthritis Initiative

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Objective. **To examine the work participation of Dutch people with early osteoarthritis (OA) in hips or knees and compare this with data from the American Osteoarthritis Initiative (OAI) cohort. The influence of health status and personal factors on work participation was analyzed.**

Methods. **In the Cohort Hip and Cohort Knee (CHECK) study, 1,002 subjects were included. Baseline questionnaire data from 970 subjects were analyzed. Rate ratios were calculated to compare work participation with the general Dutch population, after correcting (by stratifying) for age, sex, and education. Health status was measured using the Short Form 36 health survey and the Western Ontario and McMaster Universities Osteoarthritis Index. Groups were compared (CHECK versus OAI, workers versus nonworkers) using *t*-tests.**

Results. **The mean age of the subjects was 56 years and 79% were women. Overall participation was 51%, similar to the general Dutch population and lower than in the OAI (76%). Point prevalence of sick leave because of hip/knee symptoms was 2%, and year prevalence was 12%. Of the subjects, 14% had made work adaptations. Workers reported significantly better health status (corrected for age, sex, and education) than nonworkers.**

Conclusion. **Work participation of Dutch people with early OA is similar to the general population and significantly lower than American subjects. Increasing age, female sex, and lower education level were related to lower participation. Societal factors appear to have had more effect on work participation than health status in this stage of OA. The better health status of workers could not be explained solely by selection bias, but may be a result of work.**

INTRODUCTION

Participation in paid work is an important aspect of life. Mutual relationships have been described between peoples' health, chronic disease, and participation in paid work (1). Inflammatory rheumatic diseases are known to have a strong impact on patients' ability to work (2–5). Various aspects of work force participation can be affected, from requiring more assistance at paid work to withdrawal from the work force. Not only disease aspects but also personal characteristics and job factors have an influence on work ability. The incidence of permanent work disability among people with rheumatoid arthritis (RA), for example, is high, but appears to have been declining over the last decades. Reasons for this decline are probably more effective pharmacologic therapy (6), a decrease in physically demanding work (7), and the introduction of preventive and rehabilitative programs that include attention for behavioral coping (8). In contrast to inflammatory joint disease, information on work disability in degenerative joint disease is scarce (9). A number of authors have reported work limitations, sick leave, and reduced productivity in people with osteoarthritis (OA) of the hip or knee (10–13). Because there is no cure and therapeutic opportunities for people with OA are limited, identification of

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risk factors and the prevention of disabilities are important. Furthermore, the need across Europe and other Western societies to continue employing the older workers (9) legitimates attention for the impact of hip and knee OA on work (dis)ability and participation. These issues are, therefore, the subject of study in the Cohort Hip and Cohort Knee (CHECK). Wesseling et al (14) described the CHECK population at baseline and characterized them as being in a very early disease phase. They compared them with relevant subpopulations of the American Osteoarthritis Initiative (OAI) in order to provide a basis for further research and comparison of both cohorts.

The current study was performed to answer the following questions: 1) what is the participation rate in paid work of Dutch subjects with early OA of hip and knee?, 2) does work participation of Dutch subjects with early OA differ from that of the general Dutch population and from Americans with early OA?, 3) have subjects been on sick leave because of symptoms of their hip and knee or because of other health problems?, 4) have subjects made work adaptations because of symptoms of the hip and/or knee, and were these adaptations related to job type?, and 5) are there differences in personal characteristics and health status between subjects with and without paid work?

PATIENTS AND METHODS

Design. An inception cohort was formed of 1,002 participants with pain and/or stiffness of the hip and/or knee (CHECK) (14), with participants to be followed prospectively for 10 years. Ten medical centers in The Netherlands participated: Academic Hospital Maastricht, Erasmus Medical Center Rotterdam, Jan van Breemen Institute/VU Medical Center Amsterdam, Kennemer Gasthuis Haarlem, Martini Hospital Groningen/Allied Health Care Center for Rheumatology and Rehabilitation Groningen, Medical Spectrum Twente Enschede/Twenteborg Hospital Almelo, St. Maartenskliniek Nijmegen, Leiden University Medical Center, University Medical Center Utrecht, and Wilhelmina Hospital Assen. The medical ethics committees of all centers approved the cohort study, and all participants gave written informed consent before entering the study. The current report describes a cross-sectional study that was performed at baseline in the cohort (the year 2005 for most participants).

Study population. An individual was eligible for inclusion if he or she had pain and/or stiffness of the hip and/or knee, was age 45–65 years, and had consulted the general practitioner for these symptoms for the first time ≤6 months ago. Exclusion criteria were pathologic conditions other than OA that explained the existing symptoms, other rheumatic disease, previous hip or knee joint replacement, congenital dysplasia, osteochondritis dissecans, intraarticular fractures, septic arthritis, Legg-Calvé-Perthes disease, ligament or meniscus damage, plica syndrome, Baker's cyst, severe comorbidity, malignancy in the last 5 years, and inability to understand the Dutch language.

Measurements. Subjects were classified according to the Kellgren/Lawrence (K/L) rating score for radiologic OA (15). All other data in this study were collected from a comprehensive, self-administered questionnaire (in Dutch) that was composed of a set of validated questionnaires. Several aspects of work participation (present or last job, work hours, working history, present working status, sick leave) were inquired about with the questionnaire Economic Aspects in Rheumatoid Arthritis (16). Labor force participation was defined as having a paid job for ≥8 hours per week. Participants with paid employment were asked about their present condition and whether they had adapted or would like to adapt their work (tasks/hours/work place). Subjects without paid work were asked for reasons for not having a job.

Self-reported health status was measured using the Short Form 36 (SF-36) health survey (17) and the Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) (18,19). The SF-36 consists of 4 physical subscales and 4 mental subscales with a score range of 0–100, where 100 = the best health situation. The physical component summary (PCS) and mental component summary (MCS) scores were calculated as weighed means of the 4 physical and 4 mental subscale scores, respectively. The PCS and MCS scores were transformed into norm-based scores that have a normal distribution with a mean of 50 points and an SD of 10 points in the reference population (20). WOMAC has a total score range of 0–96, where 96 = the worst health situation (maximal restrictions). The total score is a summation of the scores on 3 subscales, pain (0–20), stiffness (0–8), and physical function (0–68).

The OAI. The data from the OAI were obtained from their database, which is available for public access (21). The OAI is a multicenter observational study with a followup of 4 years focusing primarily on knee OA. For comparison with CHECK we logically proceeded on the same data as Wesseling et al (14), i.e., the data of the subcohort without symptomatic knee OA, but selected on the basis of having specific characteristics that give them an increased risk of developing incident symptomatic knee OA (the incidence cohort). The baseline data on the clinical and joint status of subjects and on risk factors for the progression and development of knee OA were collected by questionnaires and examination. Based on the inclusion criteria for the CHECK study, a subgroup of the incidence cohort was selected that was comparable with the CHECK cohort: participants were ages 45–65 years, had frequent or infrequent knee symptoms, and had no surgery in either knee (n = 1,578).

Statistical analysis. The results of the CHECK questionnaire about work participation were compared with data from the general population (22). Work participation rate ratios (CHECK/general population) with 95% confidence intervals (95% CIs) were calculated. If a 95% CI includes the value of 1.0, this indicates that there is no statistically significant difference between the rates ($P < 0.05$). To correct for confounding by age, sex, and education level, the data were stratified for these factors (2). Age was strat-

Table 1. Work participation rates (%) and ratios, stratified for education level, age, and sex in the CHECK cohort and in the general Dutch population*

	Men			Women		
Age groups, years	CHECK rate, no. (%)†	Dutch rate, %	Rate ratio (95% CI)	CHECK rate, no. (%)‡	Dutch rate, %	Rate ratio (95% CI)
Primary school, no.	6			16		
45–49	§	83	–	–	50	–
50–54	§	75	–	5 (80)	39	2.0 (1.0–3.0)
55–59	§	66	–	7 (43)	25	1.7 (0–3.7)
60–64	§	22	–	§	6	–
Secondary school						
45–49	16 (94)	87	1.1 (0.5–1.6)	74 (78)	69	1.1 (0.9–1.4)
50–54	40 (85)	83	1.0 (0.7–1.4)	137 (61)	61	1.0 (0.8–1.2)
55–59	35 (71)	71	1.0 (0.6–1.4)	201 (42)	41	1.0 (0.8–1.2)
60–64	38 (16)	26	0.6 (0.1–1.1)	140 (14)	15	1.0 (0.6–1.4)
Higher education						
45–49	7 (100)	92	1.1 (0.3–1.9)	31 (77)	81	1.0 (0.6–1.4)
50–54	10 (100)	90	1.1 (0.4–1.8)	69 (74)	76	1.0 (0.7–1.2)
55–59	24 (71)	77	0.9 (0.5–1.3)	59 (66)	58	1.1 (0.8–1.5)
60–64	28 (25)	36	0.7 (0.2–1.2)	39 (13)	22	0.6 (0.1–1.1)

* CHECK = Cohort Hip and Cohort Knee; 95% CI = 95% confidence interval.
† Total n = 204.
‡ Total n = 766.
§ Data not presented because there were <5 subjects.

ified into 4 5-year groups. The highest attained education level was divided into 3 categories: primary, secondary, and higher education. Data on cells with <5 subjects were not presented because the information might have been personally identifiable and valid interpretation would have been difficult.

For subjects with paid employment, frequencies of sick leave (point prevalence and 12-month prevalence) and work adaptations (actualized and desired) were described. Frequencies of work adaptations were described for 6 categories of job type: crafts/industry, transport, administrative, commercial, service, and other. Differences in self-reported health status (SF-36 and WOMAC) between working and nonworking subjects (both CHECK and OAI) were tested using *t*-tests. To control for confounding by age and sex, data were also stratified for these factors and 95% CIs were calculated.

RESULTS

Subjects. In total, 1,002 subjects were included in the CHECK cohort study (14) and participated in the current study. Regarding work participation, 970 questionnaires were filled out completely and used for analysis (97% response rate). The mean ± SD age of the subjects was 56 ± 6 years, and 79% were women. Of the respondents, 41% had knee symptoms only, 17% had hip symptoms only, and 42% had symptoms for both the hip and knee. Based on the classification by the K/L rating score (15), the proportion of subjects with radiologic osteoarthritis (K/L grade >1) was 7% for the knee and 6% for the hip, indicating that CHECK is indeed an early OA cohort. However, 76% of the patients with knee symptoms could be diagnosed with OA according to the American College of Rheumatology (ACR) clinical criteria for classification of OA (23). Only a minority of CHECK participants with hip symptoms (24%) fulfilled the ACR clinical classification criteria for hip OA (24). The proportion of subjects in the OAI with a K/L grade >1 was 40%.

Work participation. Of all 970 subjects, 493 reported having a paid job for ≥8 hours weekly. This represents an overall work participation of 51% (60% in men, 48% in women). The proportion of subjects working >24 hours per week was 27%, 24% had smaller part-time jobs, and 13% worked >36 hours per week. Comparison of the work participation for subgroups in CHECK with the general Dutch population is presented in Table 1.

The overall work participation in the OAI was 76% (82% in men, 75% in women). In all strata, the work participation of men was higher compared with that of women. Work participation decreased with age and was higher among participants with higher education levels. A valid comparison between CHECK and the general population in the primary school education category was not feasible, because in CHECK there were only 6 men and 16 women in this category. For subjects with secondary and higher education, the participation rates were similar to those of the general population (all 95% CIs include the value of 1 for the ratios), with a tendency to be somewhat lower in the highest age group.

Of the subjects, 38 (7.7% of the working subjects) reported being on sick leave at the time that they completed the questionnaire, 10 because of hip/knee symptoms (point prevalence of 2.0% of the workers). In the past 12 months, 61 subjects had been on sick leave because of their hip or knee symptoms (year prevalence of 12.4%). The frequencies of sick leave duration were distributed evenly

Table 2. Work adaptations made and desired by subjects working ≥8 hours per week (n = 493)*

	Subjects	Total adaptations, no.	Type of work adaptation			
			Fewer hours	Other/fewer tasks	Work place/aids	Work technique
Work adaptations have been made because of my hip/knee symptoms	67 (14)	77	29 (38)	8 (10)	19 (25)	21 (27)
I would like to have my work adapted because of my hip/knee symptoms	146 (30)	176	61 (35)	43 (24)	48 (27)	24 (14)

* Values are the number (percentage) unless otherwise indicated.

over the categories of <1 week, 1–2 weeks, 2–4 weeks, 1–3 months, and >3 months.

Work adaptations. Work adaptations that were realized and desired are presented in Table 2. Subjects were allowed to report more than 1 adaptation. Working fewer hours was the most frequently realized and most desired adaptation. Adaptations in work technique involved personal adaptations, such as taking frequent short breaks and the better dividing of effort during a work day. In transport jobs, there were no subjects who reported adaptations in their function. Subjects working in crafts/industry and transport desired adaptations more frequently compared with those in other branches (results not shown).

Self-reported health status in workers and nonworkers. The 493 persons working ≥8 hours per week were labeled as having a job, and the other 477 persons were labeled as not having a job. These 2 groups were compared by personal characteristics (age, sex, education level) and on their scores on self-reported health status (SF-36 and WOMAC). The results for both groups and for the whole cohort, as well as the corresponding data for the OAI, are presented in Table 3.

In both cohorts, the group with paid jobs had a significantly lower mean age and a significantly higher proportion of men compared with the group without paid jobs. There were statistically significant differences on the physical scales of the SF-36 and on all scales of the

Table 3. Comparison of subject characteristics and self-reported health status between groups paid work and no paid work, in CHECK and OAI, all tested with independent *t*-tests*

	CHECK			OAI		
	Paid work (n = 493 [51%])	No paid work (n = 477 [49%])	All (n = 970)	Paid work (n = 1,209 [77%])	No paid work (n = 369 [23%])	All (n = 1,578)
Age, years	53 ± 5	58 ± 5†	56 ± 6	55 ± 6	59 ± 5†	56 ± 6
Men, %	25	17†	21	38	29†	36
Education level, %						
Low	2	5	3	2	5	3
Middle	66	71	70	63	70	65
High	32	23	27	35	25	32
BMI, kg/m^2	26.0 ± 4	26.4 ± 4	26 ± 4	28.7 ± 5	28.3 ± 5	28 ± 5
WOMAC scores						
Pain (0–20)	4.6 ± 3.3	5.5 ± 3.5†	5 ± 3	1.9 ± 2.7	2.4 ± 3.2†	2.0 ± 2.9
Stiffness (0–8)	2.5 ± 1.6	2.8 ± 1.7†	3 ± 2	1.5 ± 1.6	1.3 ± 1.5†	1.3 ± 1.5
Function (0–68)	14.5 ± 11.0	17.5 ± 12.1†	16 ± 12	5.9 ± 8.8	8.4 ± 11.2†	6.5 ± 9.4
SF-36 scores (0–100)						
Physical function	77.4 ± 15	72.0 ± 19†	75 ± 17			
Physical role	74.2 ± 36	68.0 ± 40†	71 ± 39			
Bodily pain	70.4 ± 17	65.4 ± 18†	68 ± 18			
General health	55.9 ± 18	51.9 ± 19†	54 ± 18			
Physical sum score	47 ± 8	44 ± 9†	46 ± 8	51 ± 7	47 ± 10†	50 ± 8
Vitality	64.9 ± 16	63.4 ± 18	64 ± 17			
Social function	82.9 ± 17	81.3 ± 19	82 ± 18			
Social role	88.0 ± 28	86.6 ± 29	87 ± 29			
Mental health	77.3 ± 14	75.7 ± 15	77 ± 15			
Mental sum score	53 ± 9	53 ± 9	53 ± 9	53 ± 8	53 ± 9	53 ± 8

* Values are the mean ± SD unless otherwise indicated. CHECK = Cohort Hip and Cohort Knee; OAI = Osteoarthritis Initiative; BMI = body mass index; WOMAC = Western Ontario and McMaster Universities Osteoarthritis Index; SF-36 = Short Form 36 health survey.
† $P < 0.05$ for difference between paid work and no paid work.

WOMAC, with workers scoring better. There were no statistically significant differences on the mental scales of the SF-36. To verify the comparability of CHECK and OAI, the analyses were repeated on the CHECK subjects with exclusion of those with only hip symptoms (17%). Of the 829 subjects with knee symptoms, 50% had a paid job, and the other reported outcome variables did not change or changed only marginally (by some decimal points). Subjects with hip symptoms reported only marginally better on some variables, including work participation (53%). The CHECK cohort reported higher scores (worse health) on the pain, stiffness, and function subscales compared with the OAI. Many differences between workers and nonworkers in CHECK remained or even increased within the strata (Table 4). Statistically significant differences were found mostly in women 50–54 years of age (3 scales) and 55–59 years of age (3 scales), and in men 60–64 years of age. In all of these cases, the workers reported better health than the nonworkers.

DISCUSSION

This study demonstrates that the work participation of people in CHECK was similar to that in the general Dutch population, and lower compared with that in the OAI cohort. The self-reported health status of the subjects with a paid job was slightly better than that of the subjects without a job, both in CHECK and the OAI cohort. A small proportion of the working subjects had made work adaptations because of their symptoms; one-third of them reported wanting their work to be adapted.

Work participation in the CHECK cohort decreased with age, female sex, and lower education level, which justifies the stratified analysis even though it resulted in a number of cells with small frequencies. Participation rates in the CHECK cohort were similar to those in the general Dutch population. Bias could have occurred from the Dutch statistics bureau definition of work participation as having a paid job for ≥12 hours weekly, whereas the CHECK questionnaire asked about working ≥8 hours weekly. This means that the results of the current study may reflect a slight overestimation of the work participation in the cohort. Moreover, the proportion of subjects in part-time work was high, and jobs with a high physical work load seem to have been underrepresented in our study, which may be related to the relatively high education level of the subjects.

Comparisons of figures on work participation between countries are sensitive to bias by such external factors as legislation and labor market conditions. For example, the organization of benefits and facilities to help the worker find or return to work varies between countries (9). From this perspective, the difference in work participation in our study, 51%, and in the OAI, 77%, was remarkably large. Overall, 36 (7%) of the 493 nonworkers in our cohort indicated that health problems were their reason for not working. The comparison of the cohorts regarding clinical and personal characteristics indicated that radiographic joint damage was clearly more outspoken in the OAI cohort, but that the CHECK subjects presented more pain, stiffness, and problems in function. Wesseling et al (14) hypothesized that CHECK was started in an even earlier phase of OA than the OAI, a phase that is not accompanied by radiographic findings. The OAI subjects were in a subsequent phase, coping with pain and disability, which may explain a decrease in reports of these characteristics while changes in anatomic structures were developing.

Not the clinical differences between the cohorts, but the differences in social and economic factors of the Dutch and American societies, are the most likely explanation for the observed difference in work participation. The point prevalence for sick leave of 7.7% in our study was slightly higher than the average prevalence in the Dutch population, which was 5.5% for workers ages 45–65 years (22). Sick leave prevalence is known for its variation, e.g., between seasons and between branches. One-third of the sick leaves reported in CHECK were due to hip and knee symptoms, which seems relatively high. As mentioned in our introduction, the impact of RA on work ability is high (32% sick leave [6]) and compared with this, the effect of early OA appears much more moderate. It must be noticed that no conclusions can be drawn on the effects in people with more progressed OA.

To explore the need for preventive measures in the early stage of OA, subjects were asked about realized and desired work adaptations. Working fewer hours was the most frequently mentioned adaptation. This suggests that a number of subjects were not able to cope with their decreased self-reported work capacity and that other ways of adapting their work load were difficult to achieve. Considering the expressed desire for work adaptations as well as the contribution of hip and knee symptoms in the reported sick leave in this early stage of OA, an increase of problems faced by these workers may be anticipated. To facilitate work continuation in this group, it is important that they express this need and that preventive interventions (25) are considered seriously by their employers. Research is needed to explore the opportunities for interventions aimed at the prevention of work disability and factors that influence the effectiveness of these interventions.

The self-reported health status (WOMAC score) of workers in CHECK as well as in OAI was statistically significantly better than that of nonworkers. A similar pattern emerged from the 4 physical SF-36 subscales. These differences persisted after correction for sex and age, and occurred similarly in subjects with knee symptoms and in the subgroup with only hip symptoms. Taking the physical function subscale as an example, the mean differences were 9.5 points (for 50–54-year-old women) and 6.2 points (for 55–59-year-old women) on a scale of 0–100. Because this scale is constructed of 10 questions with the answering options "no/minor/major restrictions," corresponding with 0, 5, and 10 points, respectively, this means that workers had 1 or 2 minor restrictions or 1 major restriction fewer. The health differences between workers and nonworkers appeared to be much smaller in patients with early OA compared with patients with RA (2), although comparison is difficult due to differences in study design and patient recruitment between studies. However, because all subjects in our cohort were recruited because of recent symptoms, sickness duration cannot be an explanation for the observed differences in our study. The clinical

Table 4. Stratified comparison of SF-36 (physical scales) and WOMAC scores between the paid work and no paid work groups in CHECK*

Outcome	Age 45–49 years		Age 50–54 years		Age 55–59 years		Age 60–64 years	
	No paid work (n = 1 man, n = 23 women)	Paid work (n = 23 men, n = 82 women)	No paid work (n = 6 men, n = 73 women)	Paid work (n = 44 men, n = 138 women)	No paid work (n = 17 men, n = 141 women)	Paid work (n = 43 men, n = 126 women)	No paid work (n = 57 men, n = 158 women)	Paid work (n = 13 men, n = 25 women)
Sf-36								
Physical function								
Men	†	79.6 (73.7–85.4)	67.5 (42.5–92.5)	77.2 (73.1–81.2)	77.2 (66.2–88.2)	79.5 (74.1–84.9)	77.3 (73.5–81.0)‡	85.8 (81.5–90.0)‡
Women	71.1 (62.8–79.4)	77.6 (74.3–80.9)	65.7 (60.4–71.0)‡	75.2 (72.6–77.9)‡	72.1 (69.1–75.1)‡	78.3 (75.5–81.1)‡	72.9 (70.2–75.6)	73.8 (67.2–80.4)
Role physical								
Men	†	77.1 (63.5–90.6)	33.3 (0–72.8)	80.7 (70.9–90.5)	75.5 (56.0–95.0)	81.1 (71.0–91.2)	83.8 (75.8–91.7)	80.8 (63.2–98.4)
Women	53.3 (34.7–71.8)	71.3 (62.6–79.9)	54.9 (44.6–65.1)	70.9 (64.4–77.4)	70.0 (63.4–76.7)	76.6 (70.3–82.9)	69.4 (63.3–75.5)	61.5 (42.0–80.9)
Pain								
Men	†	74.5 (69.2–79.8)	54.8 (31.8–77.7)	70.6 (65.8–75.4)	71.4 (61.5–81.4)	73.8 (67.8–79.9)	72.1 (68.2–76.0)	82.1 (72.9–91.3)
Women	58.2 (48.4–68.0)	70.1 (66.4–73.8)	61.1 (56.8–65.4)‡	68.3 (65.4–71.3)‡	64.3 (61.6–67.0)‡	70.7 (67.8–73.7)‡	67.1 (64.3–69.8)	63.9 (57.3–70.5)
General health								
Men	†	56.3 (50.6–61.9)	37.5 (1.3–73.7)	54.0 (49.7–58.3)	47.1 (39.3–54.8)	56.4 (50.6–62.2)	57.9 (53.3–62.4)	59.6 (46.5–72.8)
Women	48.9 (42.0–55.8)	56.1 (52.3–59.9)	45.5 (41.2–49.9)‡	54.0 (51.0–57.0)‡	52.3 (49.3–55.3)	58.1 (54.8–61.4)	53.9 (51.1–56.6)	54.0 (47.6–60.4)
WOMAC								
Pain								
Men	†	4.4 (2.9–5.9)	5.8 (1.1–10.6)	3.9 (3.1–4.7)	4.4 (2.4–6.3)	4.1 (3.1–5.1)	5.0 (4.2–5.7)	4.2 (2.3–6.0)
Women	5.7 (3.9–7.4)	4.6 (3.9–5.2)	6.1 (5.2–7.0)	5.0 (4.4–5.5)	5.6 (5.0–6.2)	4.5 (3.9–5.2)	5.5 (5.0–6.1)	5.5 (4.3–6.7)
Stiffness								
Men	†	2.2 (1.5–2.9)	3.7 (2.0–5.4)	2.8 (2.4–3.2)	2.3 (1.5–3.1)	2.3 (1.8–2.8)	2.6 (2.2–3.1)	2.1 (1.5–2.7)
Women	3.0 (2.3–2.8)	2.2 (1.9–2.6)	2.9 (2.5–3.3)	2.7 (2.5–3.0)	2.9 (2.6–3.2)	2.5 (2.2–2.8)	2.7 (2.4–3.0)	2.3 (1.6–3.0)
Function								
Men	†	12.0 (8.1–16.0)	20.0 (4.0–36.0)	13.7 (10.6–16.7)	14.1 (7.2–21.2)	14.2 (10.2–18.1)	14.6 (12.1–17.1)	8.4 (3.8–13.0)
Women	17.7 (11.7–23.7)	14.0 (11.7–16.2)	19.5 (16.2–22.7)	16.2 (14.2–18.2)	18.0 (16.1–19.9)‡	14.1 (12.2–16.1)‡	17.5 (15.6–19.2)	15.3 (11.7–19.0)

* Values are the mean scores (95% confidence intervals). SF-36 = Short Form 36 health survey; WOMAC = Western Ontario and McMaster Universities Osteoarthritis Index; CHECK = Cohort Hip and Cohort Knee.
† Data not presented because there were less than 5 subjects in these cells.
‡ Statistically significant difference.

relevance of the differences is a challenging subject for discussion, both in relation to interventions, as discussed before, and as related to explanatory mechanisms.

Two explanations seem feasible for the differences in health status between the workers and nonworkers in the cohort. On one hand, it could be a healthy worker effect (26). In occupational medicine, this is mostly considered to be a form of selection bias: part of the people have given up work because of health problems, so the remaining workers are healthier. However, only a small proportion in our cohort reported not working because of being partially or completely work disabled (and very few of whom because of hip or knee problems). On the other hand, having a job may have had a beneficial effect on our working subjects' health. This hypothesis is supported by the observation that the recently retired subjects had health scores similar to those of the subjects with paid work. However, considering the cross-sectional design of this study, confirmation of either proposition remains to be seen from followup measurements.

In conclusion, at baseline in the cohort study, our subjects appeared to be similar to the general Dutch population with regard to most aspects of work participation. Small differences in health status between workers and nonworkers were observed, which indicate a relationship within the Dutch society between health and functional status and work participation. Comparison with the OAI suggests that differences in societal aspects, e.g., the health insurance system or the free choice of people to do paid work or not, had a strong additional influence on this relation. The Dutch social system apparently allows persons with mild functional limitations not to have paid work at a relatively young age, whereas the US stimulates them to work. Followup analyses will be aimed at identifying predictive factors in the relationship between work and health.

AUTHOR CONTRIBUTIONS

All authors were involved in drafting the article or revising it critically for important intellectual content, and all authors approved the final version to be submitted for publication. Mr. Bieleman had full access to all of the data in the study and takes responsibility for the integrity of the data and the accuracy of the data analysis.

Study conception and design. Bieleman, Oosterveld, Oostveen, Reneman, Groothoff.

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Analysis and interpretation of data. Bieleman, Oosterveld, Oostveen, Reneman, Groothoff.

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